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**EUROPEAN PATENT APPLICATION**

21 Application number: 90200921.6

51 Int. Cl.<sup>5</sup>: **C11D 1/88, C11D 1/22,**  
**C11D 3/30, C11D 3/43**

22 Date of filing: 13.04.90

30 Priority: 21.04.89 GB 8909157

43 Date of publication of application:  
24.10.90 Bulletin 90/43

64 Designated Contracting States:  
AT BE CH DE DK ES FR GB GR IT LI LU NL SE

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54 **Hard-surface cleaning compositions.**

57 Hard surface cleaning compositions are disclosed which comprise anionic surfactants ammonium salts, monoethanolamine or diethanolamine or triethanolamine or mixtures thereof and a solvent system; the compositions herein have an alkaline pH.

**EP 0 393 772 A2**

## HARD-SURFACE CLEANING COMPOSITIONS

Technical field

The invention relates to a hard surface cleaning composition which provides at the same time good  
 5 cleaning performance and good shine.

Background

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Hard surface cleaning compositions are well known in the art and their cleaning performances have been well improved over the years. While focusing on cleaning performances, a new problem has been encountered in that good shine results were not obtained with these compositions, unless the surface which had been cleaned had also been rinsed afterwards, i.e., that good shine performance was incompatible with  
 15 good cleaning performance, in a non rinse-type hard surface cleaner. Indeed, when used, most compositions leave streaking traces and/or a residual film on the cleaned surfaces which, as a consequence, do not have a good appearance.

Such problem is particularly a nuisance when the hard surface cleaner is used to clean windows or mirrors, because the residual film is even more apparent.

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As far as windows are concerned, compositions have been formulated which yield "volatile" cleaners, which deal efficiently with this problem; such compositions, however, may not be used to clean all surfaces because they often contain solvents which tend to dissolve some materials. Additionally, these compositions have other negatives such as inflammability and noxious odor.

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As an alternative, some compositions have been formulated which contain relatively high amounts of ammonia; the use of ammonia is satisfactory with regard to the filming/streaking problem, but is most unsatisfactory for safety issues, as well as for product aesthetic issues. Indeed, the presence of ammonia leads to products which have unpleasant odors.

US 3,591,510 discloses hard surface cleaners which contain surfactants possibly in the form of their ammonium salt, a solvent mixture, and a water soluble builder.

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US 3,591,509 discloses compositions containing surfactants possibly present in the form of their ammonium salt, a solvent mixture, a water soluble builder and a water soluble carboxymethylcellulose.

GB 2 160 887 discloses a composition containing an anionic surfactant, water soluble and water insoluble alcohols and an organic solvent.

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J 62034998 discloses compositions containing an anionic surfactant salt, a water soluble solvent, sodium or potassium hydroxide, and monoethanolamine.

J 58101198 discloses compositions containing alkanolamine, a mixture of anionic and nonionic surfactant and polypropylene glycol.

It is an object of the present invention to provide liquid, hard surface cleaning compositions which have good cleaning performance as well as good shine performance, even in a non rinse use.

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It is another object of the present invention to provide liquid, hard surface cleaning compositions which can be used on all surfaces, and which are especially efficient on glass.

It is still another object of the invention to provide a hard surface cleaner which is suitable for use with any dispensing means, especially with a spray dispenser.

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It is still another object of the present invention to provide compositions which are free of ammonia and, therefore, have no noxious odor.

Other objects and advantages of the present invention will appear from the following description.

Summary of the invention

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The invention provides hard surface cleaning compositions which have a pH of at least 8.5 and which comprise

- from 0.04% to 0.6% by weight of the total composition of anionic surfactants ammonium salts,
- from 0.2% to 2.0% by weight of the total composition of monoethanolamine, or diethanolamine or

triethanolamine or mixtures thereof

- from 3% to 14% by weight of the total composition of a solvent system.

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#### Detailed description of the invention

The compositions of the invention contain anionic surfactants ammonium salts, at a level ranging from 0.04% to 0.6%, preferably from 0.07% to 0.45% by weight of the total composition.

10 The anionic surfactants for use herein include alkyl benzene sulfonates or sulfates, paraffin sulfonates, olefin sulfonates, sulfonates of fatty acids and of fatty acid esters and the like which are well known in the detergency art. Also suitable are ethoxylated species such as alkyl polyethoxy sulfates and sulfosuccinates.

Preferred surfactants for use herein are C<sub>8</sub>-C<sub>18</sub> alkyl benzene sulfonates and C<sub>8</sub>-C<sub>18</sub> alkyl polyethoxy sulfates.

15 Most preferred for the working of the invention, is a mixture of C<sub>8</sub>-C<sub>18</sub> linear alkyl benzene sulphonate and a 3 times ethoxylated C<sub>8</sub>-C<sub>18</sub> alkyl sulfate.

All anionic surfactants are present in the composition in the form of their ammonium salts.

The compositions of the invention further contain from 0.2% to 2.0% by weight of the total composition of monoethanolamine, or diethanolamine or triethanolamine or mixtures thereof, preferably from 0.35% to 20 0.75%. Preferably, the composition herein contain monoethanolamine at the herein above indicated levels.

Importantly, the compositions of the invention have a pH of at least 8.5, preferably 10.5

The alkalinity of the composition is essentially determined by the amount of mono, di or tri ethanolamine or mixtures thereof; these compounds act as buffer systems and allow to raise the alkalinity of the compositions and yet, do not react with the ammonium salt of surfactants. As a consequence, no 25 ammonia is liberated, and the present compositions have no noxious odors.

The compositions of the invention also contain a solvent system, at levels ranging from 3% to 14% by weight of the total composition, preferably from 5% to 11%.

Suitable solvents for use herein are n-butoxy propanol, ethanol, isopropanol, n-butoxypropoxypropanol, butylcarbitol (i.e. 2-(2-butoxyethoxy)ethanol) , hexylene glycol, hexylcarbitol (i.e. 2-(2-hexoxyethoxy)ethanol) 30 and mixtures thereof.

The preferred solvent system consists in a mixture of n-butoxy propanol with ethanol or isopropanol, in a ratio of from 1:20 to 1:2. Most preferably the solvent system consists in a mixture of n-butoxypropanol and ethanol in a ratio of 1:3.

Additionally, the compositions may contain minor amount of builders such as nitrilotriacetates, polycarboxylates, nitrates, water soluble phosphates, silicates, ethylene diamine tetraacetate (EDTA), amino 35 polyphosphonates, phosphates and mixtures thereof.

The compositions of the invention are obtained by mixing all the ingredients together; the hard surface cleaners thus obtained are suitable for use in any dispensing means currently used in this technological field, but preferably, they will be used as spray cleaners. These compositions are suitable for use on all 40 surfaces, especially on windows or any glass material.

The composition of the invention may also contain other optionals such as perfumes, dyes, optical brighteners, soil suspending agents, enzymes, freeze thaw, bactericides and preservatives.

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#### Example

The following composition according to the invention is prepared by mixing all ingredients (percentages are by weight of total composition)

50 0.07% Linear alkyl benzene sulfonate ammonium salt  
0.10% 3 times ethoxylated alkyl sulfate ammonium salt  
2% n-butoxy propanol  
6% ethanol  
0.5% monoethanolamine

55 up to 100% water and miscellaneous  
the compositions of the invention have a pH of 10.5

This composition was compared to a reference compositions of the following formula, as a representative of the prior art

0.013% 3 times ethoxylated alkyl sulfate sodium salt

9.0% butyl cellosolve

0.2% ammonia

up to 100% water and miscellaneous

5 this composition has a pH of 11

These two compositions were compared for their shine performance (on mirrors and windows) as well as for their cleaning performance.

The cleaning performance was evaluated on synthetic soils as described in the following :

HBTS soil : is composed of 250 ml isopropyl alcohol, 75 g. calcium stearate powder and 0.5 g. carbon lack.

10 It is applied on an enamel-coated metal plate (cleaned with a detergent and then with alcohol) with a paint roller, and the plates are baked at 180° for 20 minutes.

KD soil : is composed of 25% HSW<sup>R</sup> soil with carbon black (2), 37.5% Crisco® (1) oil, 37.5% Puritan® (1) oil. This soil is rolled onto stainless steel plates (beforehand cleaned with a detergent and then with alcohol) using a paint roller. A very thin uniform layer is needed since the soil is difficult to cure. The plates are  
15 placed in the oven at 115° C ("soft soil") or 170° C ("hard soil") for 2 hours and then allowed to age at least 1 day.

(1) commercial cooking oil sold by The Procter & Gamble Company

(2) Commercial soil sold by Chem Pack Inc., U.S.A.

The test conditions were as follows :

20 All tests were run with the aid of an Erichsen washability machine. A sponge of approximately 9,5 x 5 x 4 cm was used after being carefully washed under hot running water and squeezed through drying rolls 5g. of the undiluted cleanser to be tested on spread over one side of the sponge. The number of strokes of the cleaning machine needed to clean the plates were counted.

The shine performance was evaluated on clean mirrors and on windows (indoor and outdoor); the  
25 degree of filming/streaking is visually evaluated by 3 judges working independently using a 0-4 scale, whereby 0 = no difference and 4 = great difference.

The results were the following :

	HBTS	KD	CLEAN MIRROR	(WINDOW)	
				Indoor	Outdoor
				(# strokes)	(psu)
Reference	> 200	10	0 (ref)	0 (ref)	0 (ref)
Invention	> 200	16	+ 1,8	+ 1,1	0

40 This pannel shows that the compositions of the invention have good cleaning performances as the reference compositions and better shine performance.

### Claims

- 45 1. A hard surface cleaning composition having a pH of at least 8.5 which comprises  
 -from 0.04% to 0.6% by weight of the total composition of anionic surfactant ammonium salt,  
 -from 0.2% to 2.0% by weight of the total composition of monoethanolamine, or diethanolamine or triethanolamine or mixtures thereof  
 -from 3% to 14% by weight of the total composition of a solvent system.
- 50 2. A composition according to claim 1, comprising  
 -from 0.07% to 0.45% by weight of the total composition of an anionic surfactant ammonium salt,  
 -from 0.35% to 0.75% by weight of the total composition of monoethanolamine,  
 -from 5% to 11% by weight of the total composition of a solvent system.
- 55 3. A composition according to any of the preceding claims, characterized in that the solvent system of a mixture of n-butoxy propanol and ethanol.
4. A composition according to claim 3, wherein the mixture consists of n-butoxy propanol and ethanol in a ratio of from 1:20 to 1:2
5. A composition according to any of the preceding claims, characterized in that it has a ph of from 8.5

to 11.

6. A composition according to claim 5, characterized in that it has a pH of about 10.5.

7. A composition according to any of the preceding claims, characterized in that it is suitable for use as a spray cleaning composition.

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